

What is claimed is:

1. In an electronic device that provides a block diagram environment, a method comprising the steps of,
5 instructing a first function to invoke a portion of a first block from the block diagram executing at a first rate; and
 instructing a second function to invoke a portion of a second block from the block diagram executing at a second rate, wherein each of said functions unconditionally define an execution path for each of the rates.
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2. The method of Claim 1, further comprising the step of instructing a third function to invoke another portion of the first block from the block diagram executing at the first rate, wherein the third function relates to the first function and the third function implicitly corresponds to a subsystem of the first block.
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3. The method of Claim 1, wherein the first and second functions are associated with an argument list having selected arguments necessary for invoking the first and second function, respectively.
- 20 4. In an electronic device that provides a block diagram environment, a method, comprising the steps of,
 providing a block diagram having a plurality of systems, wherein a first group of systems process data at a first rate and a second group of systems process data at a second rate;
25 generating a first set of functions, the first set of functions being associated with the first group of systems to invoke said first group of systems implicitly therefrom; and
 generating a second set of functions, the second set of functions being associated with the second group of systems to invoke said second group of systems
30 implicitly therefrom.
5. The method of Claim 4, wherein the block diagram has one or more subsystems that process data at one of the first rate and the second rate.

6. The method of Claim 5, further comprising the step of generating a set of sub-functions, the set of sub-functions being associated with the subsystems to invoke said subsystems implicitly therefrom.

- 5 7. In an electronic device that provides a block diagram environment, a method comprising the steps of,
- providing a block diagram that includes a block having functions defined in a mechanism outside of the block diagram;
- identifying portions of the block by a rate of operation, and
- 10 grouping code for the block into a plurality of functions, wherein there exists at least one function for each portion of the block identified.

8. The method of Claim 7, wherein the grouping of the code comprises sets of code statements free of logical predicates.

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9. The method of Claim 7, wherein the mechanism comprises a selected programming environment.

10. The method of Claim 9, wherein the selected programming environment
- 20 comprises a structured programming environment.

11. The method of Claim 9, wherein the selected programming environment comprises an object oriented programming environment.

- 25 12. In an electronic device that provides a block diagram environment, a method comprising the steps of,

providing a block having two or more components that execute at different rates;

- separating generated code for the block into two or more sets of code
- 30 statements, with one set of code statements for each rate; and

associating each of the sets of code statements with a corresponding one of the components of the block.

13. The method of Claim 12, wherein the block performs one or more functions defined by a mechanism outside a context of a model in which the block operates.

14. The method of Claim 12, wherein the step of associating each of the sets of code statements with a corresponding one of the components of the block based on rate performs an implicit association providing an unconditional execution path for each set of code statements.

15. In an electronic device providing a block diagram environment, a method for generating code from a multi-rate block diagram model having one or more sub-systems that include an elementary block having two or more operating rates, the multi-rate block diagram model performing a plurality of operations at a plurality of operating rates, the method comprising the steps of,

identifying the plurality of operating rates contained in the multi-rate block diagram model, wherein each block in the multi-rate block diagram model has one or more operating rates and each of the plurality of identified operating rates indicates a rate of an associated operation of one of the blocks in the multi-rate block diagram model;

generating code from the multi-rate block diagram model, the generated code having one function for each identified operating rate, wherein each of the functions provides implicit identification of one of the identified plurality of operating rates per groups of blocks in the multi-rate block diagram model; and

generating code from the multi-rate block diagram model for the one or more sub-systems, the generated code having a sub-function corresponding to a selected one of the plurality of identified operating rates for the elementary blocks in the sub-systems and relate to the function for the selected operating rate, wherein the sub-function provides implicit identification of the selected operating rate per a subsystem of the groups of blocks.

16. The method of Claim 15, wherein each of the functions generated for each of the plurality of identified operating rates invokes only the blocks executing the rate to which the function corresponds.

17. A device readable medium holding device executable instructions for performing a method for generating code from a multi-rate block diagram model having one or more sub-systems that include an elementary block having two or more operating rates, the multi-rate block diagram model performing a plurality of
5 operations at a plurality of operating rates, the method comprising the steps of,
determining from the multi-rate block diagram model the plurality of operating rates contained in the multi-rate block diagram model, wherein each block in the multi-rate block diagram model has one or more operating rates and each of the plurality of operating rates indicate a rate of an associated operation of one of the
10 blocks in the multi-rate block diagram model; and
generating code from the multi-rate block diagram model, the generated code having one function for each of the plurality of operating rates, wherein each of the functions provides implicit identification of one of the plurality of operating rates per groups of blocks in the multi-rate block diagram model; and
15 generating code from the multi-rate block diagram model for the one or more sub-systems, the generated code having a sub-function corresponding to a selected one of the plurality of identified operating rates for the elementary blocks in the sub-systems and relate to the function for the selected operating rate, wherein the sub-function provides implicit identification of the selected operating rate per a subsystem
20 of the groups of blocks.

18. The method of Claim 17, wherein each of the functions generated for each of the plurality of operating rates invokes only the blocks executing the rate to which the function corresponds.

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19. A device readable medium holding device executable instructions for performing a method in a block diagram environment, said method comprising the steps of,
instructing a first function to invoke a portion of a first block from the block
30 diagram executing at a first rate; and
instructing a second function to invoke a portion of a second block from the block diagram executing at a second rate, wherein each of said functions unconditionally define an execution path for each of the rates.

20. The method of Claim 19, further comprising the step of instructing a third function to invoke another portion of the first block from the block diagram executing at the first rate, wherein the third function relates to the first function and the third function implicitly corresponds to a subsystem of the first block.

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21. The method of Claim 19, wherein the first and second functions are associated with an argument list having selected arguments necessary for invoking the first and second function, respectively.

10 22. A device readable medium holding device readable instructions for performing a method in a block diagram environment, said method comprising the steps of,

identifying from a block diagram a plurality of systems, wherein a first group of systems process data at a first rate and a second group of systems process data at a
15 second rate;

generating a first set of functions, the first set of functions being associated with the first group of systems to invoke said first group of systems implicitly therefrom; and

generating a second set of functions, the second set of functions being
20 associated with the second group of systems to invoke said second group of systems implicitly therefrom.

23. The method of Claim 22, wherein the block diagram has one or more subsystems that process data at one of the first rate and the second rate.

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24. The method of Claim 22, further comprising the step of generating a set of sub-functions, the set of sub-functions being associated with the subsystems to invoke said subsystems implicitly therefrom.

30 25. A device readable medium holding device executable instructions for performing a method in a block diagram environment, said method comprising the steps of,

importing into a block diagram a block having functions defined in a mechanism outside of the block diagram;

identifying portions of the block by a rate of operation, and
grouping code for the block into a plurality of functions, wherein there exists
at least one function for each portion of the block identified.

5 26. The method of Claim 25, wherein the grouping of the code comprises sets of
code statements free of logical predicates.

27. The method of Claim 25, wherein the mechanism comprises a selected
programming environment.

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28. The method of Claim 27, wherein the selected programming environment
comprises a structured programming environment.

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29. The method of Claim 27, wherein the selected programming environment
comprises an object oriented programming environment.

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30. A device readable medium holding device executable instructions for
performing a method in a block diagram environment, said method comprising the
steps of,

selecting a block having two or more components that execute at different
rates;

separating generated code for the block into two or more sets of code
statements, with one set of code statements for each rate; and

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associating each of the sets of code statements with a corresponding one of the
components of the block.

31. The method of Claim 30, wherein the block performs one or more functions
defined by a mechanism outside a context of a model in which the block operates.

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32. The method of Claim 30, wherein the step of associating each of the sets of
code statements with a corresponding one of the components of the block based on
rate performs an implicit association providing an unconditional execution path for
each set of code statements.